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EXAMINER

RAMIREZ, DELIA M

ART UNIT PAPER NUMBER

1652

DATE MAILED: 09/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/577,005

Applicant(s)

ASAKURA ET AL.

Examiner

Delia M. Ramirez

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 07 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 20-26 and 28-46 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 20-23, 25-26, 29, 31-34, 37-42, 44-46 is/are rejected.
- 7) ☒ Claim(s) 24, 28, 30, 35, 36 and 43 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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## **DETAILED ACTION**

### ***Status of the Application***

Claims 20-26, 28-46 are pending.

Applicant's amendment of claims 20-26, 28-37, cancellation of claim 27, and addition of claims 38-46 in a communication filed on 7/7/2004 are acknowledged.

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7/7/2004 has been entered.

Applicants have submitted new claims 39-45 directed to the elected product and new claims 38 and 46 as directed to a non-elected method of use. While none of the product claims are in condition for allowance at this time, to advance prosecution, method claims 38 and 46 will be rejoined for examination herein. A restriction requirement between elected Group III (cancelled claims 12 and 14, directed to a glutamic acid synthesizing gene having a specific promoter) and non-elected Group VI (cancelled claims 16-17, directed to a method of producing an amino acid by culturing a coryneform bacterium), as presented in a previous Office Action mailed on 9/10/2001 by the previous Examiner of record, is hereby withdrawn.

Rejections and/or objections not reiterated from previous office actions are hereby withdrawn.

### ***Claim Objections***

1. Claims 20-26 and 28-38 are objected to due to the recitation in claim 20 of "comprising the DNA sequence situated..". It is suggested that the term be amended to recite "comprising a

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DNA sequence situated....” since the DNA sequence has not been previously defined in the claim prior to the recitation of the term. Appropriate correction is required.

### ***Specification***

2. The specification was previously objected to due to the submission of a new sequence listing containing 66 sequences instead of 64 sequences as originally presented. The specification was also objected to due to the presence of a “g” instead of an “f” in SEQ ID NO: 62, position 29, as originally filed.

3. Applicants have indicated that the addition of two sequences is to introduce the CD regions corresponding to the polynucleotides of SEQ ID NO: 31 and 32. Also, Applicants submit GenBank entry X72855 in support of the amendment of position 29 in originally filed SEQ ID NO: 62 (now SEQ ID NO: 64) from “f” to “g”. Applicants arguments and evidence has been considered. In view of the fact that the corresponding polypeptide sequences were indicated in originally filed SEQ ID NO: 31 and 32 in conjunction with the nucleotide sequences, and in view of the GenBank entry submitted, previous objections are hereby withdrawn.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out

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the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 20-23, 25-26, 29, 31-34, 37-42, and 44-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bormann et al. (GenBank accession number X59404, 1992), Eikmanns et al. (GenBank accession number X66112, 1994), Nakamura et al. (GenBank accession number AB025424, April 1999), and Eikmanns et al. (GenBank accession number X71489, 1995) in view of Lewin, Genes IV, 1990. Bormann et al. teaches the *C. glutamicum* gene encoding glutamate dehydrogenase, Eikmanns et al. teaches the *C. glutamicum* gene encoding citrate synthase, Nakamura et al. teaches the *C. glutamicum* gene encoding aconitase, and Eikmanns et al. teaches the *C. glutamicum* gene encoding isocitrate dehydrogenase. Neither Bormann et al., Nakamura et al. nor Eikmanns et al. teach the hexamers TTGTCA, TTGACA, or TTGCCA at about position –35 from the transcription start site of the *C. glutamicum* genes, or the hexamers TATAAT or TATAAC at about position –10 from the transcription start site of the *C. glutamicum* genes. Lewin teaches that the hexamer TATAAT corresponds to the –10 consensus sequence. This consensus sequence is found close to 10 base pairs upstream of the transcription start point (page 225, right column). Lewin also teaches that the hexamer TTGACA corresponds to the –35 consensus sequence. This consensus sequence is found close to 35 base pairs upstream of the transcription start point (page 226, left column). In addition, Lewin teaches that mutations in the promoters affect the level of expression of genes they control without altering the gene products themselves (page 226, left column, last paragraph). Lewin does not teach *C. glutamicum* genes encoding glutamate dehydrogenase, citrate synthase, aconitase, or isocitrate dehydrogenase.

Claims 20-23, 25, 29, 31, 33 are directed in part to coryneform bacteria genes encoding glutamate dehydrogenase, citrate synthase, aconitase or isocitrate dehydrogenase, wherein said gene comprises the hexamer TTGACA at about position –35 from the transcription start site.

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Claims 26, 32, 34 are directed in part to coryneform bacteria genes encoding glutamate dehydrogenase, citrate synthase, aconitase or isocitrate dehydrogenase, wherein said gene comprises the hexamer TTGACA at about position -35 from the transcription start site, and further comprises the hexamer TATAAT at about position -10 from the transcription start site. Claims 37-38 are directed to coryneform bacteria comprising the genes of claim 20 as described above, or a method to produce L-glutamic acid which comprises culturing a microorganism expressing any of the genes of claim 20. Claims 39-42, 44 are directed to coryneform bacteria genes encoding glutamate dehydrogenase, citrate synthase, aconitase or isocitrate dehydrogenase, wherein said gene comprises the hexamer TATAAT at about position -10 from the transcription start site. Claims 45-46 are directed to coryneform bacteria comprising the genes of claim 39 as described above, or a method to produce L-glutamic acid which comprises culturing a microorganism expressing any of the genes of claim 39.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the *C. glutamicum* genes of Bormann et al., Eikmanns et al., and Nakamura et al. by replacing the -35 and/or 10 consensus sequences with the hexamers of Lewin at about positions -35 and/or -10 from the transcription start site. Furthermore, it would have been obvious to one of skill in the art at the time the invention was made to transform a coryneform bacterium with said modified genes and culture said transformed coryneform bacterium for L-glutamic acid production.

A person of ordinary skill in the art is motivated to modify the *C. glutamicum* genes at the positions recited with the hexamers of Lewin in view of the fact that (1) alterations in the promoter region can result in increased level of expressions, as taught by Lewin, and (2) the hexamers of Lewin correspond to well-known consensus sequences for promoters at those exact positions. In addition, a person of ordinary skill in the art is motivated to transform coryneform bacteria, such as *C. glutamicum*, with these modified *C. glutamicum* genes and culture

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transformed *C. glutamicum* for the benefit of obtaining increased levels of L-glutamic acid since *C. glutamicum* is a well-known organisms for the production of L-glutamic acid, and the enzymes encoded by the genes recited in the claims are enzymes known to be part of the L-glutamic acid synthesis pathway. One of ordinary skill in the art has a reasonable expectation of success at (1) modifying the *C. glutamicum* genes of Bormann et al., Eikmanns et al., and Nakamura et al. and introduce the hexamers of Lewin at the specified positions, (2) transforming a coryneform bacterium with the modified *C. glutamicum* genes, and (3) culturing the transformed coryneform bacteria, since gene mutation, host cell transformation, and cell cultivation is well known and widely practiced in the art. Therefore, the invention as a whole would have been prima facie obvious to a person of ordinary skill in the art at the time the invention was made.

#### ***Allowable Subject Matter***

6. Claims 24, 28, 30, 35-36, 43 appear to be allowable over the prior art of record but are objected to since they depend upon a rejected base claim.

#### ***Conclusion***

7. No claim is in condition for allowance.

8. Certain papers related to this application may be submitted to Art Unit 1652 by facsimile transmission. The FAX number is (703) 872-9306. The faxing of such papers must conform with the notices published in the Official Gazette, 1156 OG 61 (November 16, 1993) and 1157 OG 94 (December 28, 1993) (see 37 CFR 1.6(d)). NOTE: If Applicant submits a paper by FAX, the original copy should be retained by Applicant or Applicant's representative. NO DUPLICATE COPIES SHOULD BE SUBMITTED, so as to avoid the processing of duplicate papers in the Office.

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9. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PMR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Delia M. Ramirez whose telephone number is (571) 272-0938. The examiner can normally be reached on Monday-Friday from 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Ponnathapura Achutamurthy can be reached on (571) 272-0928. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1234.

Delia M. Ramirez, Ph.D.  
Patent Examiner  
Art Unit 1652

DR  
August 26, 2004

  
REBECCA E. PRIORITY  
PRIMARY EXAMINER  
~~GROUP 1800~~  
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